

FACT SHEET FOR STATE WASTE DISCHARGE PERMIT ST 6119

FACILITY NAME Heraeus Shin-Etsu America, Inc.

Issuance Date: July 10, 2002

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INTRODUCTION

This fact sheet is a companion document to the draft State Waste Discharge Permit No. ST 6119. The Department of Ecology (the Department) is proposing to issue this permit, which will allow discharge of wastewater to the City of Camas Publicly Owned Treatment Works (the POTW). This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

Washington State law (RCW 90.48.080 and 90.48.160) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. This statute includes commercial or industrial discharges to sewerage systems operated by municipalities or public entities which discharge into public waters of the state. Regulations adopted by the state include procedures for issuing permits and establish requirements which are to be included in the permit (Chapter 173-216 WAC).

This fact sheet and draft permit are available for review by interested persons as described in Appendix A—Public Involvement Information.

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix D—Response to Comments.

GENERAL INFORMATION	
Applicant	Heraeus Shin-Etsu America, Inc.
Facility Name and Address	Heraeus Shin-Etsu America, Inc. 4600 NW Pacific Rim Blvd. Camas, WA 98607-9401
Type of Facility:	SIC No. 3229: Manufacturing of Quartz glass crucibles
Facility Discharge Location	Latitude: 45° 36' 30" N Longitude: 122° 27' 30" W
Treatment Plant Receiving Discharge	City of Camas Publicly Owned Treatment Works (the POTW)
Contact at Facility	Name: Gary Lewis, Maintenance and Facilities Supervisor Telephone #: (360) 834-4004 ext. 208 Fax #: (360) 834-3115
Responsible Official	Name: Katsuhiko Kemmochi Title: President

Figure 1 Heraeus Shin-Etsu America, Inc. location (pushpin)



BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

Heraeus Shin-Etsu America, Inc. operates a quartz glass manufacturing industry in Camas, Washington. The facility is jointly owned by Heraeus Amersil, Inc. and Shin-Etsu Quartz Products. The finished product is a high purity glass crucible that is used in the semi-conductor industry in the manufacture of silicon wafers.

HISTORY

Heraeus Shin-Etsu America Inc. completed construction of its facility at Camas, Washington in December 1991. The facility consumes 300,000 pounds of silica sand per month to produce 6,500 pieces of high purity glass crucibles. The production process produces maximum of 31,000 gallons of wastewater per day.

In mid-1990s Heraeus Shin-Etsu America Inc. completed a plant expansion. As a result the production output has been increased significantly.

INDUSTRIAL PROCESSES

Silica sand, used as raw material, is received at the facility's loading dock and stored in a warehouse area to await processing. Sand is then purified using heat and hydrogen chloride. Some sand is additionally purified using a magnetic separation process prior to the heat and gas treatment. Metals and other solid waste generated during this process is disposed off site. The sand is then formed into stainless steel molds and fused into quartz glass crucibles using a high power electric arc. The fusion equipment and quartz glass is cooled during and after the process with an open tower process cooling water system. The crucibles thus formed are sand blasted to remove loose sand from the outside surface and then rinsed with Deionized (DI) water. The tops of the crucibles are then cut to height and the outside diameter is ground to meet customer specifications. Deionized (DI) water is used as coolant for the cutting and grinding operations. The crucibles are finally rinsed with DI water. Depending upon customer specifications some crucibles are pressure washed with high pressure water jet using DI water. All wastewater generated during this process is sent to the onsite pretreatment system.

Each finished crucible is visually inspected for defects and dimensional characteristics are measured with an automatic electronic measuring machine.

Crucibles that pass dimensional inspection are etched with hydrofluoric acid solution, rinsed with DI water, and dried with heat. Wastewater generated is again sent to the onsite pretreatment system. This is followed with a final inspection for visible surface defects. The crucibles are then packaged and stored in warehouse for eventual shipment.

TREATMENT PROCESSES

Two distinct wastewater streams are generated at Heraeus Shin-Etsu America Inc. as discussed below:

A. Fluoride containing waste stream is a combination of the following:

- i) Wastewater produced during hydrofluoric acid etching of the crucibles and subsequent washing with DI water and heat drying (batch)
- ii) Acid (HF) fume scrubber wastewater (continuous)
- iii) Laboratory wastewater (batch)
- iv) Furnace cleaning wastewater (batch)

B. Non-fluoride containing wastewater consists of the following:

- i) Finishing. Wastewater generated during cutting, grinding and washing operations in the manufacture of crucibles (batch)
- ii) Gas Scrubber blowdown (continuous)
- iii) Non-contact process cooling water blowdown (batch)
- iv) Reverse osmosis containment stormwater (batch)
- v) Waste Treatment chemical storage (batch)

C. Other wastewaters:

- i) Reverse osmosis reject water (batch) (used as wet scrubber makeup water)

The fluoride containing wastewater is treated (with prior flow equalization) in a fluoride treatment system where lime is added to treat fluoride. This is followed by pH correction, coagulation/ flocculation, and settling. Sludge produced is dewatered using filter press and the sludge cake is disposed of with the facility's other solid wastes. The supernatant is combined with treated non-fluoride waste stream before being discharged to the City of Camas sanitary sewer.

The non-fluoride waste stream is pH corrected with prior flow equalization before being combined with the treated fluoride waste stream and subsequent discharge to the sanitary sewer.

The process cooling water blowdown is discharged into a flow equalization tank.

The engineering report for the treatment system was approved prior to issuance of the initial permit. However, due to increases in production, the sizes of the wastewater treatment sludge and lime tanks needed to be increased in 1998. Also, the sewer pumping systems needed to be modified to accommodate increased wastewater flow. The previous treatment system had a design flow rate of 20 GPM. Any future modifications to the existing treatment system must be proposed in an engineering report and be approved by Ecology prior to treatment system modification.

DESCRIPTION OF THE RECEIVING POTW

The City of Camas POTW is located at 1129 S.E. Polk Street, Camas, Washington. The POTW provides secondary sewage treatment via a conventional activated sludge system followed by ultraviolet disinfection. The design capacity of the POTW is listed in Table 1.

Table 1 The City of Camas POTW design capacity

Parameter	Units	Design Capacity
Maximum monthly flow	Millions of gallons per day (MGD)	6.10
Biochemical oxygen demand (BOD) influent loading	Pounds per day (lb/d)	5,616
Total suspended solids (TSS)	lb/d	6,405

The effluent from the Sewage Treatment Plant is discharged to Columbia River, a Class A receiving water, at latitude 45° 34' 44" N and longitude 122° 23' 17" W.

PERMIT STATUS

The previous permit for this facility was issued on March 4, 1998.

An application for permit renewal was submitted to the Department on December 13, 2001 and accepted by the Department on January 24, 2002.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received an inspection on June 8, 2001.

During the history of the previous permit, the Permittee has remained in substantial compliance (Table 2) based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

Table 2 Summary of compliance with the previous permit

Date	Monitoring Parameter	Sample Measurement	Permit Requirement
July 1998	Fluoride, average monthly	15	13
July 1999	Fluoride, maximum daily	27	26

The following Figure 2 shows the facility compliance history based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The data presented is for the last three years and five months.

Figure 2 Compliance history

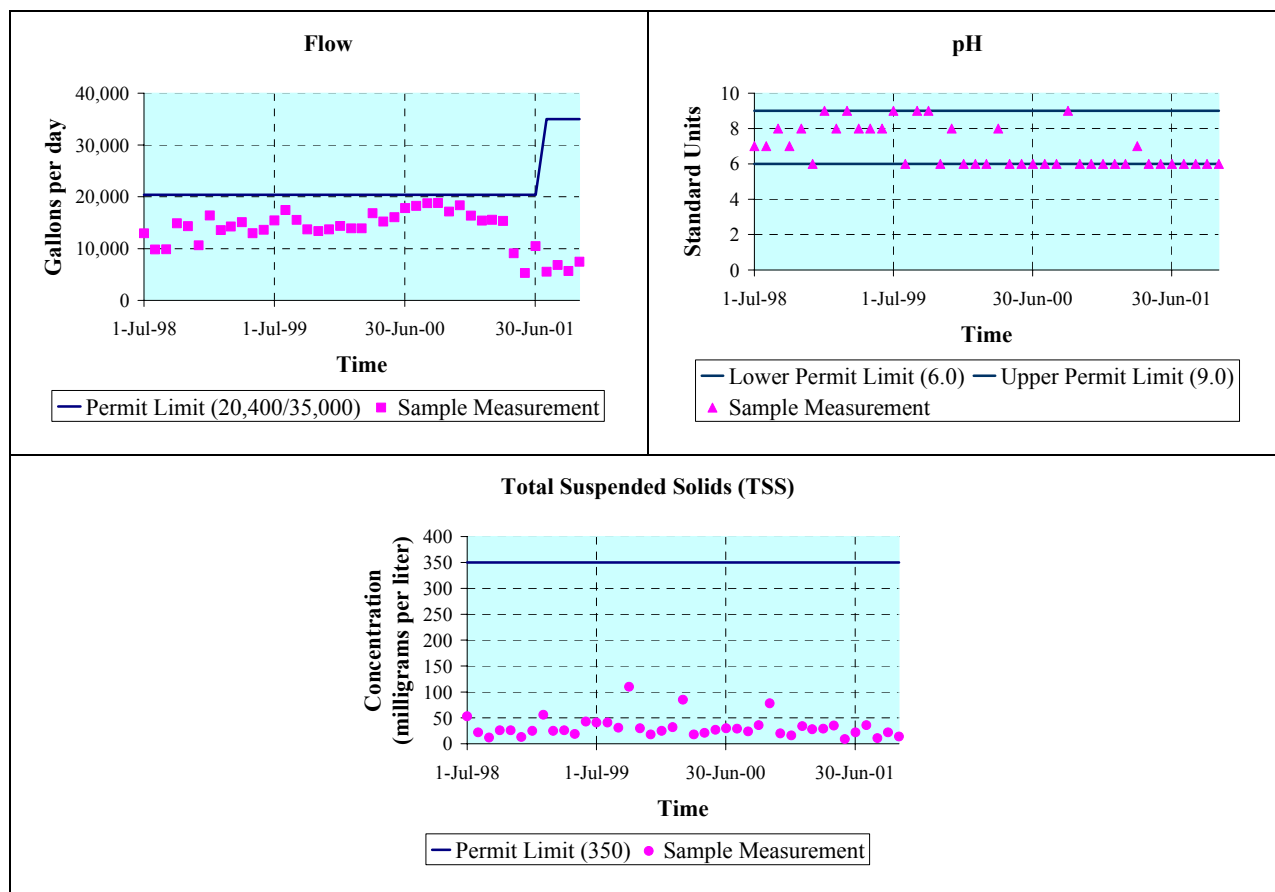
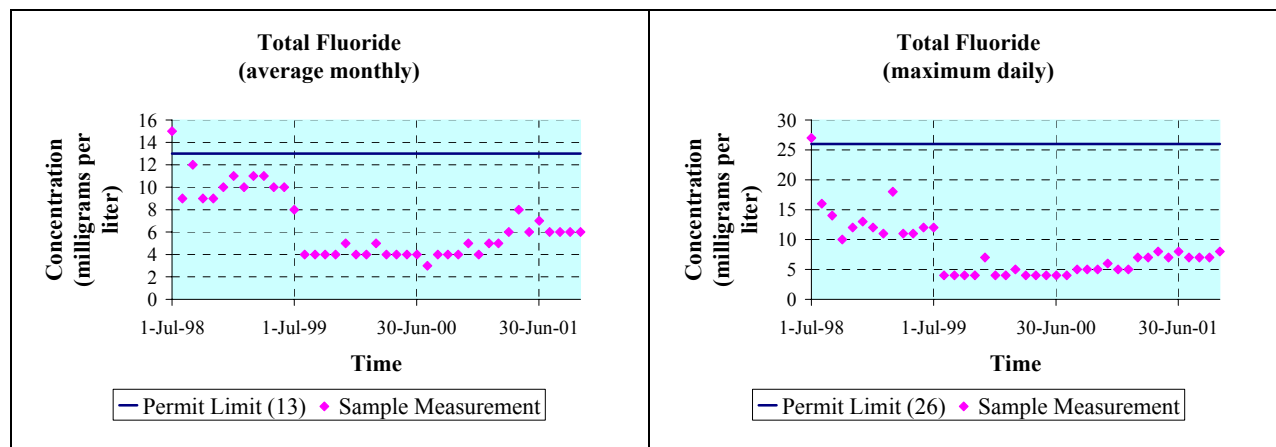


Figure 2 Compliance history



WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the permit application (Table 3) and in discharge monitoring reports. The proposed wastewater discharge is characterized in the permit application for the following parameters:

Table 3: Wastewater Characterization

Pollutant or Parameter	Units	Maximum Daily Value	Method Detection Limit	Permit Limit
Flow	Gallons per day (GPD)	29,000		35,000
pH	Standard units (S.U.)	6-9	0.1	Within the range of 6.0 to 9.0
Total Suspended Solids (TSS)	Milligrams per liter (mg/L)	9-78.	1.	350
Fluoride, total	mg/L	2-8	0.2	13, average monthly 26, maximum daily
Fluoride, free	mg/L	5.1	0.2	None
Ammonia Nitrogen	mg/L	ND	0.2	None
Nitrogen	mg/L	3.5	0.1	None

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a waste discharge permit must be based on the technology available to treat the pollutants (technology-based) or be based on the effects of the pollutants to the POTW (local limits). Wastewater must be treated using all known, available, and reasonable treatment (AKART) and not interfere with the operation of the POTW.

The minimum requirements to demonstrate compliance with the AKART standard and specific design criteria for this facility were determined in the engineering report on the pretreatment system dated March 14, 1991. The engineering report was approved on July 30, 1991. In 1994 the waste stream was segregated into fluoride and non-fluoride wastes and the treating solution for fluoride removal was changed from calcium chloride to calcium hydroxide because of cost effectiveness. In October 1996 the waste stream was further segregated in an attempt to eliminate fluoride discharge violations.

The more stringent of the local limits-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All waste discharge permits issued by the Department must specify conditions requiring available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). Existing federal pretreatment categorical limitations for this facility are found under 40 CFR Part 426, Subpart M - Hand Blown and Pressed Glass Manufacturing Subcategory. The following permit limitations are necessary to satisfy the requirement for AKART (as per 40 CFR Part 426.136):

Fluoride 26 mg/L (daily maximum) and 13 mg/L (monthly average).

EFFLUENT LIMITATIONS BASED ON LOCAL LIMITS

In order to protect City of Camas Sewage Treatment Plant from pass-through, interference, concentrations of toxic chemicals that would impair beneficial or designated uses of sludge, or potentially hazardous exposure levels, limitations for certain parameters are necessary. These limitations are based on local limits established by City of Camas (as codified in the Local Sewer Ordinance) and the general and specific prohibitions contained in the National Pretreatment Standards, 40 CFR Part 403. Applicable limits for this discharge include those listed in Table 4.

Table 4 Applicable limits

Parameter	Unit	Limit
Flow	GPD	35,000
pH	S.U.	Within the range of 5.5 to 9.0
TSS	mg/L	350

COMPARISON OF LIMITATIONS WITH THE EXISTING PERMIT ISSUED MARCH 4,, 1998

Table 5 Existing and proposed effluent limits

Pollutant or Parameter	Units	Existing Limits	Proposed Limits
Flow	GPD	35,000	35,000
pH	S.U.	In the range of 6 to 9	In the range of 5.5 to 11 ¹
TSS	mg/L	350	350
Fluoride, total (average monthly)	mg/L	13	13
Fluoride, total (maximum daily)	mg/L	26	26

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, and that effluent limitations are being achieved (WAC 173-216-110).

¹ Based on the City of Camas approval dated January 8, 2002

The monitoring schedule is detailed in the proposed permit under Condition S2 Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-216-110 and 40 CFR 403.12 (e),(g), and (h)).

PROHIBITED DISCHARGES

Certain pollutants are prohibited from being discharged to the POTW. These include substances which cause pass-through or interference, pollutants which may cause damage to the POTW or harm to the POTW workers (Chapter 173-216 WAC) and the discharge of designated dangerous wastes not authorized by this permit (Chapter 173-303 WAC).

DILUTION PROHIBITED

The Permittee is prohibited from diluting its effluent as a partial or complete substitute for adequate treatment to achieve compliance with permit limitations.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to POTW permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Conditions G7 and G8 relate to permit renewal and transfer. Condition G9 requires the Permittee to control production or wastewater discharge in order to maintain compliance with the permit. Condition G10 prohibits the reintroduction of removed pollutants into the effluent stream for discharge. Condition G11 requires the payment of permit fees. Condition G12 describes the penalties for violating permit conditions.

PUBLIC NOTIFICATION OF NONCOMPLIANCE

A list of all industrial users which were in significant noncompliance with Pretreatment Standards or Requirements during any of the previous four quarters may be annually published by the Department in a local newspaper. Accordingly, the Permittee is apprised that noncompliance with this permit may result in publication of the noncompliance.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics. The Department proposes that the permit be issued for five years.

APPENDICES

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on March 6, 2002 in the *Columbian* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on May 21, 2002, in the *Camas-Washougal Post* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6280, or by writing to the address listed above.

This permit and fact sheet were written by Jacek Anuszewski, P.E.

APPENDIX B—GLOSSARY

Ammonia—Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation—The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of the collection or treatment facility.

Categorical Pretreatment Standards—National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity—Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Engineering Report—A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Grab Sample—A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User—A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Interference— A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Local Limits—Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

Maximum Daily Discharge Limitation—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Pass-through— A discharge which exits the POTW into waters of the-State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTW's.

Slug Discharge—Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate which may cause interference with the POTW.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Coliform Bacteria—A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

Total Dissolved Solids—That portion of total solids in water or wastewater that passes through a specific filter.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit—A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C – RESPONSE TO COMMENTS

No comments received.